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*As the Budget Ax Swings*

## Pentagon's Scientific, Industrial Roles Face Cuts

It's clear that troop and weapons accounts will diminish as the traditionally sacrosanct Pentagon budget feels the effects of the sudden wilting of 40 years of east-west animosity. But far less certain is the fate of a variety of defense-financed science and industrial programs that got attached to the Department of Defense mainly because money was easier to find there in the good old days of the Cold War.

Soon a lot of that money may be gone, for Washington is swirling with talk of defense-spending cuts, ranging from a few percentage points down to a 50 percent reduction in defense outlays by 1999, a plunge deemed attainable in a forthcoming Brookings Institution study: *Glasnost, Perestroika and US Defense Spending*, by William W. Kaufmann (113 pp., $8.95, due at the end of December; order from: Brookings Institution, Publications Dept., 1775 Massachusetts Ave. NW, Washington, DC 20036; tel. 202/797-6105).

*New Attack on Gallo AIDS Role—P. 4*
*Bromley and Fetal-Tissue Ban—P. 5*

To an extent that's not generally realized, DoD has for decades functioned as a middling-size version of the university-supporting National Science Foundation and also as an agency that in other lands would be labeled the Department of Industry. But the industrial title is ideologically impermissible in the US government table of organization, since the name smacks of federal industrial policy, a bugbear to Republicans and controversial among Democrats.

Through a variety of programs, DoD's support of academic science and engineering totals about $1 billion a year, which is just about half the sum NSF annually puts into academe. Of the $1 billion from defense, about half is for basic research, while the rest is for applied research and engineering. In the economics of academic research, the Pentagon is a major factor, even though NSF Director Erich Bloch periodically chastises it for not spending more for university science and engineering (SGR, September 15: "DOD Share of Research Too Big, NSF Head Says"). The Pentagon, Bloch insists, consumes basic research but does little to advance it, and thus is guilty, as he puts it, of taking a "free ride" on civilian-supported basic research. Maybe so, but what there is of its money is gratefully received.

DoD support keyed to improving industrial technology, particularly in manufacturing, is too widely scattered among Pentagon offices and the three major services to allow a precise tally, but in total it's probably well over $750 million a year. The best-known item of Pentagon support for industrial technology is the $100 million a year that the Defense Advanced Research Projects Agency (DARPA) provides for Sematech, the Austin-based, 14-firm industrial consortium focused on semiconductor manufacturing research. But DARPA, which is also providing a well-publicized $30 million a year to keep American industry involved with high-definition television (HDTV) research, is only one of several Pentagon agencies spending money to keep Ameri-

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## In Brief

**On the eve of adjournment last month, Congress voted a truncated lease on life for the R&D Tax Credit and the University Basic Research Credit, top priority items for the Washington science lobby. Due to expire at the end of this year, both were extended to the end of 1990, but the allowed credits were pared by 25 percent. The measures cut taxes for firms that increase R&D spending and also for research-related gifts to universities. Several studies, however, show that the credits cost far more in tax revenue than they generate for research, and support on Capitol Hill is far from robust.**

*A last-minute vote before the Senate went home brought confirmation for two Associate Directors of the White House Office of Science and Technology Policy (OSTP): James B. Wyngaarden, the former NIH Director, who will handle biomedical affairs at OSTP, and J. Thomas Ratchford, the former No. 2 on the staff of the American Association for the Advancement of Science, who will be in charge of policy and international relations. Still to come are nominations for two other Associate Directors.*

**OSTP Director D. Allan Bromley was unable to make a scheduled address November 6 to the annual meeting of the Consortium of Social Science Associations, Washington lobby for the soft sciences. But he sent a letter extolling them as underutilized tools for public policy, adding that "as soon as budgetary considerations allow, we intend to appoint an Assistant Director for the social sciences." The letter said that "The social and behavioral sciences will also be represented on the new President's Council of Advisers on Science and Technology."**

*Yet to emerge from the torpid White House clearance process, the Council—acronymed PCAST—will consist of 12 members. It is supposed to derive prestige from its status as adviser to the President, rather than to the Science Adviser, to whom the predecessor White House Science Council provided advice in the Reagan Administration.*

# . . . Threats to Sematech Draw Congressional Fire

*(Continued from Page 1)*

can industry alive in high-tech fields.

Among the more sentient inhabitants of the defense establishment, the scientific and industrial roles are accepted as important for military prowess and therefore worthy of DoD support in the absence of other sources of money. But, by and large, these programs exist in an atmosphere of merely tolerant or even grudging, rather than heartfelt, acceptance. Many within the armed services feel their scarce funds must be put into these activities to make up for the failings of the civilian sector, but they are not really keen for it. Throughout the Reagan Administration, the White House Science Office tried to prod the Pentagon into providing more money for university-based basic research. Out of this effort came the University Research Initiative (URI) as a supplement to other and bigger DoD programs in universities. But despite academe's high hopes for rapid growth of the program, the URI budget this year stands at a mere $96 million.

What's next in the new atmosphere of a declining defense budget? The answer is veiled in grand confusion as the Pentagon and the services, under directives to plan for sizeable cuts in spending, maneuver to minimize the damage. For that purpose, a time-tested method is to mobilize the support of powerful constituencies by rumoring that their favored ventures face the ax. Thus, in recent weeks, it's been reported that DARPA has been instructed to withdraw from supporting high-definition TV research. In turn, that rumor led to doubts about the continuity of support for Sematech. Denials then came from various points, including Presidential Science Adviser D. Allan Bromley. A declaration that the cuts would be "economic insanity" was issued by Democratic Reps. Richard Gephardt, of Missouri and Mel Levine and Norman Mineta, of California, and by Republican Senator John Heinz, of Pennsylvania.

But even with the President's FY 1991 budget due to go to Congress in little over a month, the Bush Administration remains confusingly split on the federal government's industrial role. The official Bush-Reagan ideology says that Washington doesn't belong in the business of propping up capitalist firms that can't compete. The dirty term in the dialog is "industrial policy," and the official view is that the US doesn't have one and is better off without it. Bromley, in fact, recently defended DARPA's support for HDTV research on the grounds that research is not industrial policy.

Regardless of the semantic acrobatics, the needs of defense, the frailties of many high-tech American firms, and technological soft spots in the American industrial economy have raised serious concerns in political circles. The clearest manifestation came in August 1988 when the Democratic Congress, over the opposition of the outgoing Reagan Administration, recast the venerable National Bureau of Standards into the National Institute of Standards and Technology (NIST).

The legislation gave NIST several major responsibilities that ordinarily would be assigned to the Ministry of Industry (or a similarly named agency) in other nations: providing high-tech guidance for small firms; identifying and supporting key technologies; stimulating regional high-tech development, and so forth. But first Reagan, and now Bush, have dealt with this Democratic creation by essentially ignoring it. As Bush approaches the end of his first year in office, NIST is still headed by an acting Director holdover from the Reagan days, Raymond G. Kammer Jr., who was brought up from his regular post of Deputy Director. (A nominee for Director, John W. Lyons, Director of the NIST National Engineering Laboratory, was forwarded to the Senate too late for confirmation in the recently ended session of Congress.)

Within the Commerce Department (parent agency of NIST), the newly created position of Under Secretary for Technology remains vacant, in part because of the usual recruiting difficulties, but also because of an absence of urgency about the job in the Department and the White House. The latest word is that after Tom Vanderslice, the former chief of Apollo Computers, turned it down, the search was stalled for several months, but now it has yielded another high-achieving computer executive, soon to be nominated by the White House.

Stalled appointments, however, are not the only problems afflicting Commerce and NIST in their new industrial roles. Budgets for carrying out the additional responsibilities, mostly concentrated in NIST, have not been forthcoming. One result is that NIST's internal politics are now dominated by competitive tensions between old programs, hardpressed as ever for funds, and the looming new ones, for which most of the financing will have to come from general funds.

Until now, none of these problems has affected the Pentagon in its quiet performance as the nation's de facto Department of Industry. Virtually unnoticed in Washington, the Defense Manufacturing Technology Program currently

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# . . . DoD Functions as a Department of Industry

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provides $170 million a year for a wide variety of industrial programs, ranging from welding techniques to ship design, from automated inspection of engine parts to weaving techniques for combat uniforms. The Pentagon money is often teamed with industrial and state support, and in many instances university researchers are brought into the picture.

For example, the Defense Logistics Agency—one of the several DoD agencies that support industry—recently awarded the Chicago-based IIT Research Institute $24 million to establish and run an Instrumented Factory for Gears in partnership with industrial firms and the State of Illinois, which are putting up $8 million. The program is justified on the grounds that military trucks and tanks use a lot of gears. Since the same can be said of non-military vehicles, the bankrolling of a gear factor by the Defense Department might be seen as having something to do with industrial policy. But, at least until recently, the ideological alarms have been silent in regard to industrial policy Pentagon style.

Defense officials take credit for launching or expanding the use of several important new technologies. In Congressional testimony last March, Lloyd L. Lehn, Director of the Pentagon's Manufacturing Technology Program, brought up the case of composite materials, crediting DoD programs with innovations which "spilled over into the private sector where fabrication techniques once considered only for weapons systems now appear in commercial products."

Defense also runs what's called the Industrial Modernization Incentives Program (IMIP), which aims "to promote contractor investment for improved industrial productivity and competitiveness," according to Congressional testimony in May by Richard E. Donnelly, DoD Assistant Deputy Under Secretary for Manufacturing and Industrial Programs. "The Air Force," he said, "currently has the most aggressive IMIP"—$533 million matched by $1.3 billion from industrial contractors. The other services and the Defense Logistics Agency, he said, are coming along, too.

"The DoD," Donnelly concluded, "recognizes the importance of the domestic industrial base and has taken the measures discussed to ensure it remains strong, innovative, and responsive to our requirements."

The charade about the inappropriateness of a US industrial policy continues while the Defense Department and its ample budgets carry out major elements of industrial policy. But, with the bottom falling out of defense spending, what happens now in that area and also in DoD support of academic science? The answer is that there are no plans or even dominant forces dealing with these matters in Washington today. The Administration is confused and divided; the Congress is too unwieldy an institution for making policy in the domestic circumstances that arise from the astonishing changes in Soviet-American relations.

Apart from DoD serving its own purposes by devising industrial programs, there is no US industrial policy. As for science policy, the increasingly ramshackle American scientific enterprise clearly needs better means of deciding on what to spend its limited resources—in other words, it needs a policy. But no one in Washington is talking about that, even though DoD—a major source of money for academic science—is going through budgetary convulsions.—DSG

## *1990 Budget Gets Snipped Rather than Slashed*

When Congress went home last month, it left behind a budget situation so confused that two weeks later, it was hard to find general agreement on how much money will be available for spending by federal agencies in a fiscal year that is already two months old.

Some who crave certainty are hoping that the mists will be dispelled by a forthcoming declaration from the Office of Management and Budget. In the meantime, it appears that the budgets passed by the Congress and signed into law by the President for fiscal 1990—which ends next Sept. 30—will be snipped to meet deficit-reduction requirements, but the damage will be slight.

Prior to Congressional adoption of a Budget Reconciliation package for holding down the deficit, appropriations for civilian agencies were trimmed, or sequestered, by 5.3 percent, an amount that would virtually wipe out all growth for basic research and a good deal else in science and technology.

But the Budget Reconciliation negated the 5.3 percent reduction, replacing it with a formula that reduced, but did not eliminate, the need for reductions. The formula for the lesser reductions starts with the "sequester base," an agency's fiscal 1989 appropriation plus inflation. Step two is to deduct 1.4 percent of the 1989 sequester base from the 1990 appropriation. In the case of the National Science Foundation, which received an appropriation of about $2 billion for 1990, that works out to about $28 million which NSF expected but won't get. Under the initial sequester of 5.3 percent, it would have been a lot worse—something over $100 million. Still to be settled is how the cuts will be distributed within an agency's budget.

The question of how to respond to the budget confusion is much on the minds of the scientific and academic representatives stationed in Washington to keep their homebases informed. The difficulty in coming up with a reliable answer is that there is really no way of knowing whether the post-sequester calculations will prove durable for the remainder of the fiscal year. With Congressional elections less than a year away, the politics of federal spending will be as tempting as ever for campaign exploitation by a Republican President saddled with a Democratic Congress. Later in the fiscal year, a presidentially decreed cutback could occur.

# Gallo's Claims in AIDS Research Assailed Anew

Robert C. Gallo, NIH's most celebrated AIDS researcher, is the unflattered subject of an extraordinary 16-page, 50,000 word article, "The Great AIDS Quest," in the November 19 *Chicago Tribune*, by John Crewdson, who received a Pulitzer Prize while with the *New York Times* in 1981.

The article, two years in preparation, is often savage in tone, and comes extremely close to accusing Gallo of scientific fraud. An introduction by James D. Squires, editor of the *Tribune*, charges that Gallo "fought [the newspaper's] Freedom of Information requests for public records and made numerous attempts to discredit Crewdson's reporting and impugn his personal integrity, both with his editors and with members of the scientific community."

Of Gallo's claimed discovery of the AIDS virus, Crewdson writes that "the evidence is compelling that it was either an accident or a theft." In referring to Gallo's acrimonious priority dispute with Luc Montagnier, of the Pasteur Institute—since settled with an agreement that co-discovery occurred—Crewdson describes Gallo as "an influential and intimidating scientist who chased the wrong virus for more than a year, only to reverse course and emerge with a virtual genetic twin of the virus that had really been discovered by his rivals in Paris and delivered to him months before."

Gallo, in response to SGR's request for comment, said derisively that he hasn't read the article and doesn't intend to. But from what he has heard, he said, "it's an old broken record"—a reference to the fact that contention between him and Montagnier was out in the open for several years before the two made a peace pact in 1987. However, citing many documents, Crewdson argues that the two scientists were pushed to an armistice by their respective governments, and that the issue of priority was simply swept under the rug.

In discussing the article with SGR, Gallo said that Crewdson "doesn't know science," and that after an initial telephone conversation in which Gallo says Crewdson spoke abusively, he declined further conversations with the reporter's researches. He added that he has received "over 60 letters" from scientists who complained about Crewdson's reportorial tactics.

Gallo also denied that he tried to block Crewdson's requests for documents under the Freedom of Information Act. "We spent hundreds of man hours responding to the requests," Gallo said.

Asked whether he would respond to the article, Gallo said that his agreement with the Pasteur Institute precludes reopening the controversy. He also said he would not consider a libel action against the newspaper because "I'm a public figure and wouldn't stand a chance"—a reference to the legal doctrine that makes public figures fair game in all but a limited number of circumstances.

Two weeks after its publication, the article has aroused little attention in scientific circles. But it is not likely to go unnoticed in Stockholm.

## *Heavyweight Science Advice For a GOP Congressman*

By sheer weight of credentials in a capital city overrun with advisory committees, who has the heaviest of them all to advise him on science and technology? It's not George Bush, who, though planning to appoint a council of Presidential science and technology advisers, hasn't yet got around to it.

The winner may well be a Republican Congressman little known outside his district, Robert S. Walker, a fifth-termer from the Lancaster, Pa., area. Walker is the top Republican, and therefore the Vice Chairman, on the Science, Space, and Technology Committee. But that position carries little power, since the Democrats outnumber Republicans on the Committee, 27-17, control most staff slots, and pretty well run things as they like.

There is an impression that this leaves the Republicans with little to do, except hope for better luck in the next election. But a different view is held by Walker, who ascended to the Committee's ranking Republican spot when his drowsy predecessor, Manuel Lujan Jr., was, to general astonishment, appointed Secretary of the Interior. Walker takes an active role in Committee hearings and sponsors various amendments. He also maintains good ties with the Republican-appointed officials in the sci-tech agencies, and was recently asked, for example, to nominate candidates for a Fusion Policy Advisory Committee at the Department of Energy. Small stuff, but in politics, the pickings are lean on the minority side of the aisle.

Where Walker really stands out, however, is in the possession of his own handpicked Science Advisory Committee, which serves him in his capacity as Vice Chairman. Its creation was Walker's idea.

Included in its membership are two Presidential Science Advisers from the Reagan Administration, George A. Keyworth II and William R. Graham. Then there's Edward Teller, of various fames; Ralph E. Gomory, former IBM Senior Vice President for S&T, now President of the Sloan Foundation; Simon Ramo, the "R" in TRW, a veteran of the federal senior science-advisory circuit; James Beggs, the former chief of NASA; John P. McTague, Vice President for Research at the Ford Motor Co.; Harold Agnew, of various nuclear-engineering renowns, plus several others.

SGR is told that this Advisory Board never meets, the reason being that "there's no money" (the Democrats keep the Republican minority on short rations). But the members have agreed to be available for consultations as matters arise. "They can give us feedback on things like superconductivity and cold fusion," a staff assistant explained.

# Science Advice: Dr. Bromley, Meet Dr. Bromley

*From an exchange of pre-confirmation written questions and answers, released July 21, between the Senate Committee on Commerce, Science, and Transportation and D. Allan Bromley, the President's nominee for Director of the White House Office of Science and Technology Policy.*

***Committee.*** If confirmed, what do you see as your most important responsibilities?. . . .

***Bromley.*** If confirmed, my most important responsibility, as a member of the President's inner circle of advisers, will be to provide him with the best available advice on both science and technology for policy and policy for science and technology. Additionally, the President has requested that "OSTP play a central role in developing and coordinating federal science and technology strategies and in analyzing crosscutting issues in research and development. . . ."

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*From questions and answers following a talk by Bromley on November 14 to the District of Columbia Chapter of the National Science Writers Association.*

***Q.*** Were you consulted on [Health and Human Services] Secretary Sullivan's recent decision to extend the ban on federal support for research involving the transplantation of fetal tissue? And are you concerned about anti-abortion sentiments and opinion impinging on certain lines of biomedical research?

***Bromley.*** The question was, did Secretary Sullivan consult me with respect to the extension of the moratorium on fetal-tissue transplant? The answer to that is no. And. . . was I concerned about the extent to which anti-abortion sentiment was impinging on appointments and other activities in the federal government?

The answer to the second one is yes. I don't believe that there is very much science and technology involved in the abortion issue. It's a very serious personal, ethical, moral, religious issue. But it, frankly, has very little to do with science and technology. So, scientists and technologists have no special insight in the area, and I am concerned that that could impact, that it could become a litmus test for positions in science and technology. That would be to the detriment of science and technology and to this country.

***Q.*** Since it clearly has been used as a litmus test in the selection of some of the people in the Health and Human Services Department, why will the White House continue to do that? They have admitted that they have and you seem to be saying that, as a person in the White House, that it may not be a good idea—let's just struggle inside the White House about whether it should or should not be used as a litmus test.

***Bromley.*** You say that it has been used. I am not aware of cases where it has been used as a litmus test.

***Q.*** [Assistant Secretary of Health] Jim Mason, Secretary Sullivan have been reported out [as using it].

***Bromley.*** There are many things that are reported out that I do not necessarily find to be absolutely correct.

***Q.*** You have just said that you were not consulted on the fetal-tissue ban. That's clearly an issue that has a major impact on scientific research that happened early on in your tenure. There was a lot of concern before about how much power the President's Science Adviser would have. That seems, on its surface, like a very bad omen that you weren't consulted on something of that magnitude.

***Bromley.*** Well, you must understand, first of all, that my credentials—. The question—I'm not so sure it's a question or a statement. The statement was that since Secretary Sullivan did not see fit to come ask me about fetal tissue in transplant, wasn't this a bad omen concerning my future as Science Adviser? I don't feel that that's the case. The fact is that Secretary Sullivan recognized, as well as I do, that I know precious little about the medical field. And had my Associate Director [for biomedical affairs, James B. Wyngaarden, former Director of NIH, whose confirmation was pending] been in place, I feel quite confident that Secretary Sullivan would have come to talk to us. But, certainly, given the situation as it existed when this decision was made, it does not strike me as indicative of total failure of my office that he didn't come to talk to us.

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SGR Editor's Note: Secretary Sullivan told the annual meeting of the Association of American Medical Colleges, October 29 in Washington, that the so-called right-to-life litmus test was inappropriate for senior scientific administrative posts. His carefully worded address was essentially an announcement of a reversal of policy whose existence was well known but never publicly acknowledged. The turnabout was inspired by the uproar in biomedical circles over application of the litmus test to candidates for two long-vacant posts, the directorships of the National Institutes of Health and the Centers for Disease Control.

As for Wyngaarden's availability for consultation on fetal-tissue transplants: though not yet confirmed for the OSTP post, he nonetheless was working there parttime under appointment as a consultant, a frequently used status for Presidential appointees awaiting confirmation.

## *Environment Research Organization To Be Established in Europe*

A European Environmental Research Organization (EERO), supported by a $500,000 grant from the Volkswagen Foundation and Swiss, Dutch, and Spanish backers, is about to be launched. The organization will be headquartered in Wageningen, The Netherlands. A 10-member council has been appointed, with K. N. Timmis, a microbiologist at the National Research Center for Biotechnology, Braunschweig, Germany, as Chairman. An announcement from EERO says a full-time Director will soon be appointed. The initial program includes the provision of fellowships for environmental studies, workshops, and laboratory courses.

# In Quotes: The Neglect of "Alternative" Agriculture

*From* Alternative Agriculture*: by the National Academy of Sciences Committee on the Role of Alternative Farming Methods in Modern Production Agriculture, chaired by John Pesek, Agronomy Department, Iowa State University.*

Much research conducted over the past 40 years has responded to the needs of farmers operating under a set of economic and policy incentives that encourages high yields. Much of the focus has been on chemical- and drug-related technologies to support specialized high-yield operations and simplify farm management. Until recently, research has generally not deliberately addressed the possibility of maintaining current levels of production with reduced levels of certain off-farm inputs, more intensive management, increased understanding of biological principles, or greater profitability per unit of production with reduced government support.

Yet, increased international competition, the decline in world market prices for most commodities, and the relatively high percentage of total variable costs for inputs needed to achieve current high yields warrants a reassessment of farming practices, research, and the effects of policy on farm decision making. In general, further increases in yield are an ineffective means of achieving greater profitability or international competitiveness. . . . The added costs of purchased inputs soon become more than the free-market value of the added yield. . . .

In spite of [many successes], biological control [of pests] remains underresearched and underused relative to its potential—even as many economically important pests, notably soil-borne pests and insect pathogens, are not effectively controlled by chemical means in many regions and important crops.

One reason for this lack of support is that the availability of relatively inexpensive, effective pesticides has clearly dampened interest in biological control. Another constraint has been the sporadic nature of publicly funded research and education efforts toward the adaptation and implementation of biological control systems in the field. . . .

Public funds for the development and delivery of biological pest control products or systems to growers are often lacking, as are funds to adequately assess conditions on individual farms. Private and public research and development expenditures for chemical control technologies in the United States have been estimated as at least five times greater than those spent for biological controls. As a result, scientific opportunities to research new biological control methods remain largely unexploited. In general, a relatively modest effort has been made to fully use those biological control systems that have been discovered.

***Alternative Agriculture* (448 pp., $19.95 paperback, $29.95 hardbound) is available from: National Academy Press, 2101 Constitution Ave. NW, Washington, DC 20418; tel. 202/334-3313.**

## *How Congress Sends Advice To the Science Agencies*

"Report language," as it's known on Capitol Hill, is a form of thinking aloud that Congressional committees write into their annual appropriations and authorization reports to express their sentiments without going through the gauntlet of writing a law. The research agencies, as usual, got their share of these quasi-legislative advisories in the session just ended.

Thus, the Senate Appropriations Subcommittee for the National Institutes of Health declared that it "is concerned about the effects on research that may result from recent investigations into allegations of misconduct in the biosciences." The Subcommittee, chaired by Tom Harkin (D-Iowa), said it "deplores those instances where scientists have been guilty of fabrication or falsification of data, or of plagiarism," but it added that it "believes that the vast majority of America's biomedical researchers are honest, dedicated, and hardworking individuals of the highest integrity."

Picking up the red-herring theme that David Baltimore and company chorused during the Nobel laureate's encounters with Rep. John Dingell—that scientists must be free to to risk errors—the report states:

"Thus, the Committee will closely monitor the work of the new NIH Office of Scientific Integrity and the HHS (Health and Human Services) Office of Scientific Integrity Review to make certain that these agencies carry out their proper roles, but do not take actions that thwart or interfere with the continued creativity and excellence that are the hallmarks of research in this country."

The Senate Appropriations Subcommittee for the White House Science Office, chaired by Barbara Mikulski (D-Md.), decreed a homework assignment for that agency. Citing an "imbalance between civilian and defense R&D" in the federal budget, the Subcommittee report "requests the President's Science Adviser to prepare and submit a report by February 1, 1990, analyzing the balance between defense and non-defense research and development. In addition, the report should include recommendations as to how this mix of federal R&D support might be reoriented to better support the nation's priorities in science and technologies."

During the Reagan Administration, the White House Science Office generally ignored such assignments. It remains to be seen how the new regime will respond.

The report of Mikulski's Subcommittee also included several assignments for NSF, another agency in its jurisdiction. It directed NSF to submit a report "on the possibility" of emulating NIH's recently established Office of Scientific Integrity. It also told NSF that it "believes" that NSF should require grantee institutions to certify that they're equipped to deal with allegations of scientific misconduct.

# More In Print: Scandinavian Science, Waste, Etc.

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of Ocean Engineering, University of Rhode Island, agrees that the EEZ is being neglected and calls for Congress to establish planning mechanisms for an expanded program, along with an "external commission" representing industry, academe, etc. It adds, "Federally sponsored EEZ activities should include a marine sanctuary reconnaissance component for discovery and identification of the seafloor deserving such long-term protection. Such designations should occur well in advance of resource development in EEZ areas to forestall potential conflict among competing uses."

**Order from: National Academy Press, 2101 Constitution Ave. NW, Washington, DC 20418; tel. 1-800/624-6242 (in Washington, DC: 334-3313).**

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***Science and Technology in Scandinavia*** (175 pp., $115), by Georges Ferne, ninth volume in the Longman Group UK Ltd. publishing firm's series of reports on national S&T policies and practices, this one covers Denmark, Finland, Iceland, Norway, and Sweden. Included are data on government organizations for the support of research and related higher education, funding procedures, budgets, etc. The coverage, of the once-over-lightly variety, is useful for a quick look. Previous volumes covered the Middle East, Latin America, China, Japan, US, USSR, France and Belgium, and Eastern Europe; in the works, Australia, Antarctica and the Pacific Islands; Africa, and UK.

**Order from: Gale Research, Dept. 77748, Detroit, Mich. 48277-0748; tel. 1-800-877/GALE (or 313/961-2242).**

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***Linking for Learning: A New Course for Education*** (GPO Stock No. 052-003-01170-1, 183 pp., $9), by the Congressional Office of Technology Assessment (OTA), requested by the Senate Labor and Human Resources Committee, says that more should be done at various levels of government to exploit the potential of "distant learning"—instruction via satellite links and other telecommunications technologies. The report notes that "While not advocating a national curriculum, the federal government has supported the development of curricular resources; similarly, there may be ways of making teaching resources available nationally."

**Order from: USGPO, Superintendent of Documents, Washington, DC 20402; tel. 202/783-3238. A summary of the report is available without charge directly from: Office of Technology Assessment, Press Office, US Congress, Washington, DC 20510-8025; tel. 202/228-6204.**

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***Partnerships Under Pressure: Managing Commercial Low-Level Radioactive Waste*** (25 pp., no charge), summary of a forthcoming major OTA report (due around the end of December), says the generation of low-level radioactive waste from nuclear plants, academic and medical facilities, etc., continues at a rapid pace without a solution in preparation or in sight for long-term safe storage. The report notes that "onsite storage volume of mixed LLW (low-level waste) is holding steady for the majority of generators when it should be increasing," leading OTA to speculate that the waste "is slipping through waste brokers and processors and illegally entering nonqualified disposal facilities."

**Order from: Office of Technology Assessment, Press Office, US Congress, Wash., DC 20510-8025; tel. 202/228-6204.**

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***Perspectives on Financing Academic Research Facilities: A Resource for Policy Formulation*** (50 pp., no charge), by the National Academy of Sciences Government-University-Industry Research Roundtable, reports "a tendency for each sector to look to the others to shoulder an increased share of the funding burden" for academic university research facilities, for which little federal money has been available for some 15 years. The report focuses on describing the problem and previously proposed remedies for dealing with it. In a brief assessment of the pork-barrel route to new lab buildings, it notes that estimates for the take range from $110 million to $300 million a year, but points out that this funding method has been denounced by many mainstream educational and scientific organizations as a threat to orderly allocation of scarce funds.

**Order from: National Academy of Sciences, Government-University-Industry Research Roundtable, 2101 Constitution Ave. NW, Washington, DC 20418; tel. 334-3486.**

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***Science International*** (20 pp., no charge). quarterly newsletter of the International Council of Scientific Unions, contains reports of activities and programs of ICSU's many constituent organizations, meeting schedules, new publication listings from the ICSU Press, etc.

**Order from: ICSU, Science International, 51 Boulevard de Montmorency, 75016 Paris, France; tel. (331) 45 25 03 29.**

# In Print: International R&D Statistics, Oceans, Etc.

*The publications listed are obtainable as indicated—not from SGR.*

***Main Science and Technology Indicators—1989, No. 1*** (46 pp., $35.40 for one-year subscription—two issues), first of a new twice-yearly assemblage of R&D-related statistics from the Organization for Economic Cooperation and Development, supplementing the *Science and Technology Indicators* report issued every two years by OECD, the 24-nation association of major industrial powers. Among the topics covered: national R&D expenditures, percent of GNP devoted to R&D, university enrollments, technological balance of payments, foreign and domestic patent applications, etc. Each copy is in English and French.

**Order from: OECD Publications and Information Center, 2001 L St. NW, Suite 700, Washington, DC 20036-4095; tel. 202/785-6323. Also available at bookshops and OECD offices in major cities throughout the world.**

***The Sematech Consortium's Start-up Activities*** (GAO/RCED-90-37, 44 pp., no charge), report by the General Accounting Office, investigative service for the Congress, ordered by the House Science, Space, and Technology Committee, examines the beginnings of Sematech, the two-year-old DoD-subsidized industrial consortium designed to keep semiconductor manufacturing alive in the US. GAO says that the Defense Advanced Research Projects Agency, which spends $100 million a year on the venture, has provided oversight that "generally has been considered beneficial," but GAO also notes continuing delays in appointing a Congressionally mandated Advisory Council on Federal Participation in Sematech. Some or all of this may become moot if, as rumored, the financially declining Pentagon bails out of Sematech.

***Ocean Fleet Research: NOAA Needs to Plan for Long-Term Fleet Requirements*** (GAO/RCED-90-42, 48 pp., no charge), also from GAO, requested by the House Subcommittee on Oceanography and the Great Lakes, says the 23-ship research and survey fleet operated by the National Oceanic and Atmospheric Administration suffers from skimpy maintenance, heavy schedules, and delayed upgrading, and that NOAA should work out plans to "provide long-term ship support to its users." The plan should allow for experimentation with "chartering/leasing arrangements," GAO recommended, adding that NOAA officials agreed and said they're working on it.

**Order from: USGAO, PO Box 6015, Gaithersburg, Md. 20877; tel. 202/275-6241.**

***The Ocean Enterprise Concept*** (about 175 pages, no charge, supply limited), proceedings of an NSF-sponsored workshop last February to stake out the future of commercial and research activities in the 200-mile exclusive economic zone (EEZ) declared in 1983. The main theme was that little has so far been accomplished in exploiting the EEZ. The conference was held in conjunction with the Woods Hole Oceanographic Institution, the University of Hawaii Center for Ocean Resources Technology, the National Sea Grant College Program, and Brown and Root, Inc. The major finding: "The lack of a US national infrastructure has inhibited the development of ocean enterprises." The workshop concluded that an expansion of ocean enterprises may require "a Congressional charter, with a federal agency serving as an incubator. . ." The report adds that creation of an Ocean Enterprise Consortium, with academic, government, and private backing, also might be needed. The proceedings contain few references to the federal agency that's supposed to be leading in these matters, the National Oceanographic and Atmospheric Administration.

**Order from: Woods Hole Oceanographic Institution, Dept. of Geology and Geophysics, Attn. David A. Ross, Woods Hole, Mass. 02543; no telephone orders.**

***Our Seabed Frontier: Challenges and Choices*** (137 pp., $16), also on the EEZ, this one, from the National Academy of Sciences Committee on Seabed Utilization in the Exclusive Economic Zone, chaired by Armand J. Silva, Chairman

*(Continued on Page 7)*

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